



Impression making for RPD

- The key for success in prosthetic dentistry is proper diagnosis and treatment planning followed by proper construction of the prosthesis. Both phases necessitate correct impression making.
- Proper preliminary impression to obtain study casts is mandatory for removable partial denture.
- Obtained study casts are surveyed to determine the amount of mouth preparation needed for a specific path of insertion. They are also mounted to study the occlusion before commencing the treatment.

Impression making for RPD

- A stock tray of suitable size and form is selected and a full arch impression in elastic material is made
- Most of these stock trays are designed to record moderately sized dentate arches of different forms. In cases of long free end saddles the dentist may have to select a specific form of stock tray or modify the tray to suit the clinical situation

Impression materials properties

	Agar	Alginate	Polysulfide	Condensation Silicone	Addition Silicone	Polyether
Preparation	Boil, temper, store	Powder, water	2 pastes	2 pastes or paste/liquid	2 pastes	2 pastes
Ease of Use	Technique sensitive	Good	Fair	Fair	Excellent	Good
Patient Reaction	Thermal Shock	Pleasant, clean	Unpleasant, stains	Pleasant, clean	Pleasant	Unpleasant clean
Ease of removal	Very easy	Very easy	Easy	Moderate	Moderate	Moderate to difficult
Disinfection	Poor	Poor	Fair	Fair	Excellent	Fair

Handling Properties

	Agar	Alginate	Polysulfide	Condensation Silicone	Addition Silicone	Polyether
Working Time (min)	7 – 15	2.5	5 – 7	3	2 – 4.5	2.5
Setting Time (min)	5	3.5	8 – 12	6 – 8	3 – 7	4.5
Stability	1 hour 100% RH	Immediate pour	1 hour	Immediate pour	1 week	1 week kept dry
Wettability and castability	Excellent	Excellent	Fair	Fair	Fair to good	Good
Cost	Low	Very low	Low	Moderate	High to very high	Very high

Properties

	Agar	Alginate	Polysulfide	Condensation Silicone	Addition Silicone	Polyether
Elastic Recovery (%)	98.8	97.3	94.5 – 96.9	98.2 – 99.6	99 – 99.9	98.3 – 99.0
Flexibility (%)	11	12	8.5 – 20.0	3.5 – 7.8	1.3 – 5.6	1.9 – 3.3
Flow (%)	--	--	0.4 – 1.9	< 0.10	< 0.05	< 0.05
Shrinkage, 24 hours (%)	Extreme	Extreme	0.4 – 0.5	0.2 – 1.0	0.01 – 0.2	0.2 – 0.3
Tear Strength (g/cm)	700	380 – 700	2240 – 7410	2280 – 4370	1640 – 5260	1700 - 4800

Comparison of Properties

- Working time

- ◆ longest to shortest

- ◆ agar > polysulfide > silicones > alginate = polyether

- Setting time

- ◆ shortest to longest

- ◆ alginate < polyether < agar < silicones < polysulfide

Comparison of Properties

■ Stiffness

◆ most to least

◆ polyether > addition silicone > condensation silicone > polysulfide = hydrocolloids

■ Tear strength

◆ greatest to least

◆ polysulfide > addition silicone > polyether > condensation silicone >> hydrocolloids

Comparison of Properties

■ Cost

◆ lowest to highest

◆ alginate < agar = polysulfide < condensation silicone < addition silicone < polyether

■ Dimensional stability

◆ best to worst

◆ addition silicone > polyether > polysulfide > condensation silicone > hydrocolloid

Comparison of Properties

■ Wettability

◆ best to worst

- ◆ hydrocolloids > polyether > hydrophilic addition silicone > polysulfide > hydrophobic addition silicone = condensation silicone

■ Castability

◆ best to worst

- ◆ hydrocolloids > hydrophilic addition silicone > polyether > polysulfide > hydrophobic addition silicone = condensation silicone

Impression making for RPD

- For primary impression; we usually use alginate impression material. A sterile tray that provides 4-6 mm material thickness is selected, alginate is mixed according to manufacturer instructions and loaded in the tray. A layer of alginate is applied to the occlusal surface of the remaining teeth as well into the labial, buccal and lingual vestibules. The tray is loaded in the patient mouth and the borders are functionally molded.

Impressions with a Stock Tray

■ Selection of tray size

- ◆ Test tray in mouth, should not impinge or bind anywhere.
- ◆ Check for tray length, use mouth mirror.
- ◆ Beading or periphery wax to improve adaptation.
- ◆ Bend tray flange if necessary.
- ◆ When using stock trays, check sizing on study cast for fit.



Impressions with a Stock Tray

- Posterior extension – add wax when necessary, check with mirror and mouth movements.
- Mandible - Always add periphery wax on lingual surface of tray, from bicuspid back to assist in displacing the tongue.
- Maxilla – Add wax to posterior palatal border.
- Warm wax for fitting, then chill with water prior to impression.

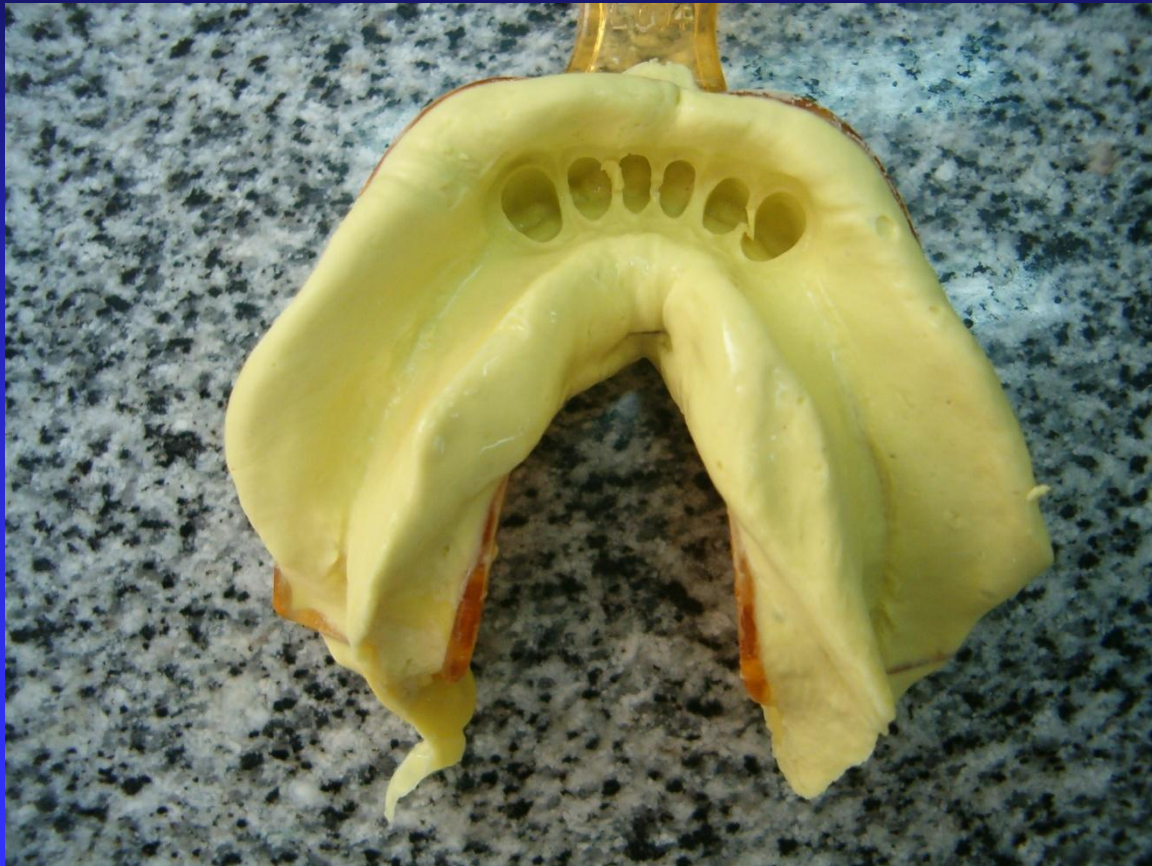
Impression with a Stock Tray

- Impression material: Alginate

- ◆ Procedure:

- ◆ Follow powder-water ratio set by manufacturer. Maybe occasionally necessary to reduce water by 5-10 cc to increase viscosity for soft tissue displacement.
- ◆ Keep impression in mouth then remove in one swift, positive movement.
- ◆ Use warm or cold water to adjust setting time.
- ◆ Pour cast immediately
 - Imbibition – distortion by water absorption.
 - Syneresis – loss of water and shrinkage distortion.

Impression making for RPD



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Care of Impressions and Making Casts

Problem

Probable cause

Surface of the cast soft or chalky

- Saliva in the impression when cast was poured
- Improper water powder ratio used
- Water from rinsing remains in impression

Distorted cast

- Impression material separated from the tray
- Air inclusion in impression that distorts when stone is poured

Care of Impressions and Making Casts

Pouring the cast

- ✿ Measure the required amounts of water and powder
- ✿ Carefully mix the stone in a vacuum power mixer
- ✿ Using gentle vibration, flow the stone into the indentations in the impression formed by the teeth.
 - ✿ Use a small brush to avoid trapping air
 - ✿ The bottom surface of the cast should be rough to facilitate attachment of the base
- ✿ Suspend the poured impression by the handle in the tray holder
- ✿ Once the stone is fully set invert the cast and add a base. The base should be 10-15 mm thick.
- ✿ After 60 minutes of the first pour, separate the impression from the tray.

Care of Impressions and Making Casts

Trimming the cast

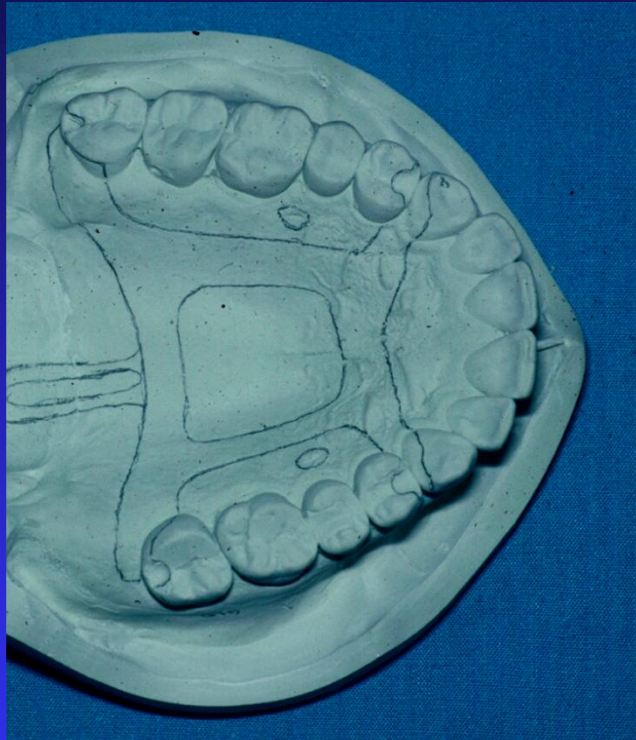


Before trimming the cast soak it in clear slurry water for 5 minutes. Trimming should not begin until 24 hours after pouring.

The cast should never be rinsed, or soaked in water because dental stone is water soluble.

Care of Impressions and Making Casts

Trimming the cast



Failure to soak the cast in slurry water will result in sludge adhering to and damaging the cast.

The cast should be trimmed so that its base is 10-15 mm thick. The land should be 4 mm wide.

Secondary impression

Final impressions for maxillary tooth- supported removable partial dentures often may be made in carefully selected and recontoured rigid stock impression trays. However, an individual acrylic resin tray is preferred in those situations in the mandibular arch when the floor of the mouth closely approximates the lingual gingiva of remaining anterior teeth. Recording the floor of the mouth at the elevation it assumes when the lips are licked is important in selecting the type of major connector to be used

Secondary impression

For free end saddle cases either mandibular or maxillary; custom made impression trays are utilized to obtain an anatomical impression i.e. both teeth and ridges are registered under the same loading. Mandibular free end saddle cases are specially important. The small area of residual mandibular ridges and the nature of crest of the ridges in these cases casts more burdens on the situation. Several techniques are described in the literature to maximize the supporting quality of residual mandibular ridges. These techniques are either physiologic or functional

Secondary impression for mandibular free end cases

Physiologic : relining dentures at delivery

Functional; McClean and Hindle

In free end saddle case; a denture constructed over an anatomic form of basal seat tissues, places more of the masticatory load on the abutment teeth and that part of the bone that underlies the distal end of the extension base. The balance of the bony ridge will not function in carrying its share of the load. The result will be a traumatic load to the bone underlying the distal end of the base and to the abutment tooth, which in turn can result in bone loss and loosening of the abutment tooth.

Secondary impression for mandibular free end cases

Some dentists believe that every partial denture should be relined before its final placement in the mouth. Some believe that tissue can be evenly displaced and use impression materials of heavy consistency. This latter practice can introduce traumatic stresses to the underlying tissues.

McClean technique depends on construction of occlusion blocks over a sectional tray, recording the impression under biting force, then performing over all impression in stock tray. The disadvantage is obvious the functional impression during the first step is lost during the overall impression

Secondary impression for mandibular free end cases

Hindle's technique depends on performing an impression in border molded sectional tray under finger pressure and then performing overall impression. The modified technique relates the sectional impression to the teeth during making the secondary impression by applying finger pressure through holes created in the stock tray. The applied pressure is not equal to that of the patient.

Individual impression trays

- An individual acrylic resin tray is made with sufficient clearance for the impression material and trimmed just short of the vestibular reflections to allow the tissues to drape naturally without distortion. The partial denture borders may then be made as accurately as complete denture borders "With equal advantages.

- Although techniques have been proposed for making individual impression trays that incorporate plastic tubing for water-cooling reversible hydrocolloid impressions, the final anatomic impression usually will be made with irreversible hydrocolloid, mercaptan rubber, or silicone impression materials.

Individual impression trays

❖ The borders are outlined and undercut areas are blocked out. A layer of baseplate wax is applied over the cast to act as a spacer. Additional layer of wax is applied over the teeth if alginate is going to be used for impression making. The "Wax spacer should be trimmed 2 to 3 mm short of the outline drawn on the diagnostic cast. Wax covering the posterior palatal seal area should be removed so that intimate contact of the tray and tissue in this region may serve as an aid in correctly orienting the tray when making the impression. Expose portions of the incisal edges of the central incisors to serve as anterior stops when placing the tray in the mouth. The tray is perforated using a suitable size bur to help retain the alginate.

Preliminary Casts



Hard and Soft Tissue Landmarks Visible.
Extensions Visible.

Custom Tray Fabrication

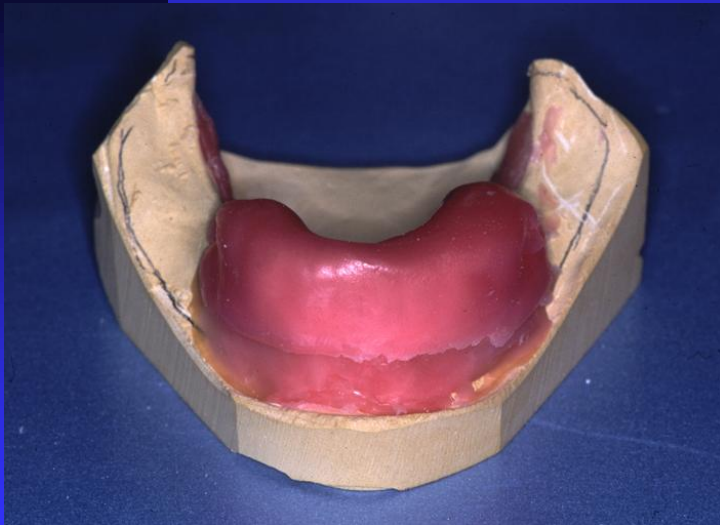


DropBooks



**Block-out Soft, Hard
Tissue Undercut Areas.**

Fabrication of Custom Trays



- Apply Spacer for Impression Material.
- Elastomeric Material: 2-4 mm
- Alginate: minimum 3 mm

Tray Resin Manipulation



Rubber Mixing Bowls.

Less Material Used.

Dough Stage Does Not Stick to Bowl.

Tray Resin Manipulation



Mixing



Check Consistency



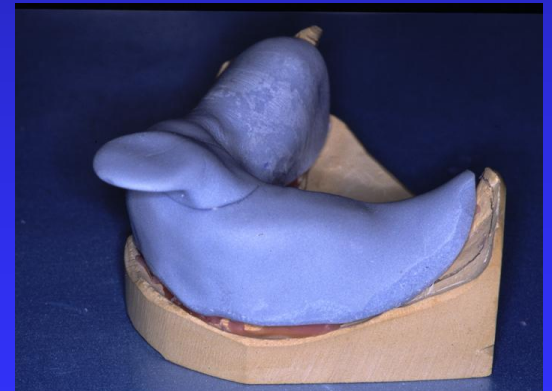
Sandy Stage



Stringy



Dough



Completed Tray

Custom Tray Fabrication



Altered Cast Impressions

- ⌘ An impression technique carried out after construction of the partial denture skeleton and its try in for mandibular free end saddle cases.
- ⌘ The skeleton is constructed to an anatomic cast produced from an impression made with custom tray.
- ⌘ A special acrylic trays are attached to the skeleton at the free end saddle areas after applying a single layer wax spacer. The original cast is sawed and an impression is taken for the free end saddle areas after border tracing, while the patient opens his mouth.
- ⌘ The operator must support the skeleton at the area of principal occlusal rests and at the indirect retainer .

Altered Cast Impressions

- The originally described technique is performed with Iowa waxes. The borders are traced with rigid wax and the impression is performed with more flowable wax
- The skeleton is constructed to an anatomic cast produced from an impression made with custom tray.
- A special acrylic trays are attached to the skeleton at the free end saddle areas after applying a single layer wax spacer. The original cast is sawed and an impression is taken for the free end saddle areas after border tracing, while the patient opens his mouth.
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Altered Cast Impressions



Altered Cast Impressions



Altered Cast Impressions



Altered Cast Impressions





Altered Cast Impressions

- Impression of residual ridge
- Custom impression tray attached to the framework



Purpose

- Impression is used to modify master cast
- More accurate relationship between abutments & ridge
- Equalize stress between ridge and abutments
- Correct peripheral adaptation

When Needed

- Framework most likely adjusted
- Class I & II - relationship most N.B.
- Extensive Class III & IV cases
- Tooth mobility + compressible mucosa
- Less necessary in maxilla

Impression Technique

- Well Fitting Framework
- Place relief over ridge
 - ◆ 1 mm wax relief
 - ◆ Separator (Alcote)
 - ◆ Heat and fully seat framework



Check Seating

- If not seated, remove, repeat
 - ◆ Rests fully seated
 - ◆ Tissue stop contacts cast
 - ◆ Metal adjacent abutment contacts cast
 - ◆ No resistance as framework seated



Check Peripheries

- 2-3 mm short of vestibular
- No displacement when:
 - ◆ Pull on cheeks, lips
 - ◆ Patient activates tongue

Border Mold

- Simulate final denture border



Make Altered Cast Impression

- Ensure tray is well retained by framework
- Remove wax spacer
- Coat tray with adhesive
- Wait 10-15 minutes



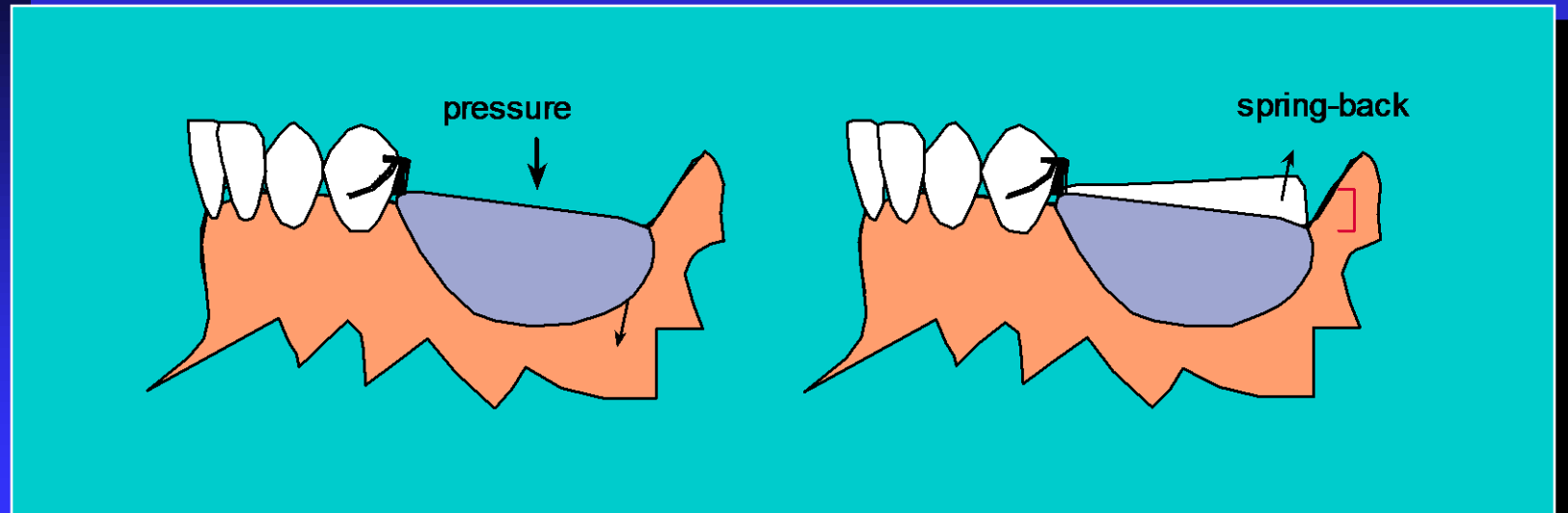
Altered Cast Impression

- Polyvinyl siloxane
 - ◆ Light or medium body
- Carefully load tray
- No material under rests, g.p.'s, max. major connector, etc.
- Seat with pressure over rests



No Pressure Over Gridwork

- Fulcruming or tissue compression
- Spring back and lack of tissue contact



Remove & Inspect Impression

- Absence of voids
- Minimal burnthrough
- Covers supporting tissues
- Fully seated, etc.



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DropBooks

